

Ensuring Hepatitis B Protection for Healthcare Personnel (HCP)

February 22, 2012
Sarah Schillie, MD, MPH, MBA

National Center for HIV/AIDS, Viral Hepatitis, STD & TB Prevention

Division of Viral Hepatitis



Overview

- Increasing proportion of HCP were vaccinated for hepatitis B virus (HBV) in infancy, or as catch-up in adolescence
 - No recommendation for post-vaccination serologic testing
- Some HCP, e.g., in a new position, have no post-vaccination serologic test results
- Healthcare schools, institutions seeking guidance to ensure HBV protection for HCP

Term of Reference

- Ensure hepatitis B protection for HCP, including trainees, who received Hepatitis B (HepB) vaccination in the remote past without post-vaccination serologic testing*

*Or who no longer have a record of post-vaccination serologic test result

2011 ACIP Hepatitis B Vaccination Recommendations for HCP

- All unvaccinated persons whose work- and training-related activities involve reasonably anticipated risk for exposure to blood or other infectious body fluids should be vaccinated with the complete, ≥ 3 -dose HepB vaccine series
- Because higher exposure risk has been reported during the professional training period, the vaccination series should be completed before trainees have contact with blood

2011 ACIP Hepatitis B Vaccination Recommendations for HCP, cont.

- To determine the need for revaccination and to guide postexposure prophylaxis, post-vaccination serologic testing should be performed for all HCP at high risk for occupational percutaneous or mucosal exposure to blood or body fluids
- Post-vaccination serologic testing should be performed 1-2 months after administration of the last dose

MMWR 2011;60 (RR-7)

2011 ACIP Hepatitis B Vaccination Recommendations for HCP, cont.

- Persons determined to have anti-HBs concentrations <10mIU/mL soon after receipt of the primary series should be revaccinated
- For these persons, a second complete 3-dose series on an appropriate schedule followed by post-vaccination serologic testing 1-2 months after the 3rd dose is usually most practical
- Persons who do not have a protective concentration after revaccination...should be tested for HBsAg and anti-HBc to determine infection status

MMWR 2011;60 (RR-7)

anti-HBs = Antibody to hepatitis B surface antigen

HBsAg = Hepatitis B surface antigen

anti-HBc = Antibody to hepatitis B core antigen

Occupational Exposure to Bloodborne Pathogens Standard

- Published by OSHA in 1991
- Requires employers to implement Exposure Control Plan, which includes:
 - Providing HepB vaccinations to employees
 - Ensuring use of personal protective equipment
 - Describing use of engineering and work practice controls

Needlestick Safety and Prevention Act

- Directed OSHA to revise Occupational Exposure to Bloodborne Pathogens standard
- Effective in 2001
 - Established greater detail in requirements that employers identify and use effective and safer medical devices

<http://www.osha.gov/needlesticks/needlefact.html>

Background

- Long-term protection after HepB vaccine series correlates with anti-HBs ≥ 10 mIU/mL measured 1-2 months after series completion
 - Vaccine induced “protection” ≥ 22 years
- Anti-HBs after primary HepB vaccine series wanes over time
- Breakthrough HBV disease uncommon among immunocompetent vaccine responders, even when anti-HBs wanes

Leuridan E. Clin Infect Dis 2011;53:68-75

anti-HBs = Antibody to hepatitis B surface antigen

Background, cont.

- HCP with anti-HBs <10mIU/mL years after HepB vaccine series does not distinguish:
 - Initial responders (protected, 90%-95% of healthy young vaccinees)
 - Delayed responders (would respond to revaccination with 3 additional doses)
 - Non-responders (susceptible to infection after 6 doses of HepB vaccine; might have past or chronic HBV infection)

Tohme R. Infect Control Hosp Epidemiol 2011; 32:818-21;
McMahon B. J Infect Dis 2009;200:1390-6

anti-HBs = Antibody to hepatitis B surface antigen

Background, cont.

- HBV is stable and highly infectious: remains viable for ≥ 7 days on environmental surfaces¹
- HCP may not be aware of, or report potential HBV exposure²
 - ~54% (38%-67%) of percutaneous injuries reported, 2002-2011* ³⁻⁷
 - ~17% (7%-44%) of mucosal exposures reported, 2002-2011* ³⁻⁷

*Studies included acute care students/residents, paramedics, nurses, surgeons

¹Bond W. Lancet 1981;1:550-1; ²MMWR 2001;50 (RR-11); ³Boal W. Am J Ind Med 2008;51:213-22;

⁴Gershon R. Ind Health 2007;45:695-704; ⁵Gershon R. Am J Infect Control 2009;37:525-33;

⁶Kessler C. Am J Infect Control 2011;39:129-34; ⁷Trinkoff A. Infect Control Hosp Epidemiol 2007;28:156-64

Changing Epidemiology of Occupational HBV Infection?

- Fewer HCP at risk? (sharps with engineered sharps injury protections, as well as vaccination coverage)?
- Decrease in HBV infection among source patients?
 - Declining incidence of acute hepatitis B
 - Changing prevalence of chronic HBV

<http://www.osha.gov/SLTC/bloodborne pathogens/standards.html>

Viral Hepatitis Surveillance, 2009, <http://www.cdc.gov/hepatitis/statistics/2009surveillance/>

Wasley A. J Infect Dis 2010;202:192-201

Draft Options* Under Consideration by the Hepatitis WG

1. No action unless exposed
2. Pre-exposure anti-HBs
3. Challenge dose of HepB vaccine

*Each option is used by US healthcare systems

anti-HBs = Antibody to hepatitis B surface antigen

Draft Option -- 1

- *No action unless exposed*
 - HCP reports percutaneous or mucosal exposure to blood or body fluids
 - Assess HCP for anti-HBs/vaccination history, and source patient for HBsAg; vaccine (≥ 1 dose HepB) and/or HBIG if indicated based on test results
 - Relies on HCP recognition of exposure and timely reporting

anti-HBs = Antibody to hepatitis B surface antigen

HBsAg = Hepatitis B surface antigen

HBIG = Hepatitis B immune globulin

Draft Option -- 2

- *Pre-exposure anti-HBs*
 - If anti-HBs ≥ 10 mIU/mL, done
 - If anti-HBs < 10 mIU/mL:
 - Administer 1 dose of HepB vaccine; retest 1-2 months later
 - If anti-HBs < 10 mIU/mL, follow current recommendations to revaccinate and measure anti-HBs*

*Non-responders; refer to review board if hepatitis B surface antigen-positive

anti-HBs = Antibody to hepatitis B surface antigen

Draft Option -- 3

- *Challenge dose of HepB vaccine*
 - Measure anti-HBs 1-2 months later
 - If anti-HBs ≥ 10 mIU/mL, done
 - If anti-HBs < 10 mIU/mL:
 - Follow current recommendations to revaccinate and measure anti-HBs*

* Non-responders; refer to review board if hepatitis B surface antigen-positive

anti-HBs = Antibody to hepatitis B surface antigen

Acknowledgements

- Hepatitis WG Members
- Division of Viral Hepatitis, NCHHSTP
 - Trudy V. Murphy
 - Meredith Reilly
 - Ruth Jiles
 - Brittney Baack
 - Emily Smith

Thank you

Discussion

Questions?

National Center for HIV/AIDS, Viral Hepatitis, STD & TB Prevention

Division of Viral Hepatitis

